Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection
Central Regional Office

Daniel S. Greenbaum
Commissioner

June 19, 1991

Ms. Nancy Smith
EPA Superfund Support Section
HSS CAN-7
JFK Federal Building
Boston, MA 02203

Re: ATF Davidson Co, Inc.
Northbridge, MA
MAD046128559

Dear Nancy:

On May 6, 1991, the DEP/CRO recieved your letter of May 2 with comments regarding the draft Site Inspection report for ATF Davidson Co., Inc. in Northbridge, MA. Comments centered on 1) the lack of proper citation, 2) clarity in writting, 3) identification of who did what on-site, and 4) whether proper QA/QC procedures were used.

Enclosed, please find the final draft of the MSCA Site Investigation for the ATF Davidson Co, Inc. in Northbridge, MA (MAD046128559). All your comments are addressed within the Final Draft.

If you have any additional questions or require additional assistance, please telephone me at your earliest convenience.

Very truly yours,

Don Hanson

Donald Hanson
MSCA Coordinator

DAH/**DAH**/dah
covitchc.omm

cc: MSCA file
21e File
Janet Waldron, DEP/Boston

Commonwealth of Massachusetts
Executive Office of Environmental Affairs
Department of Environmental Protection
Central Regional Office

Daniel S. Greenbaum
Commissioner

TO: Helen Waldrof, Branch Chief
Site Management & Enforcement Section

THRU: Lynne Chappell, Section Chief, Technical Support

FROM: Don Hanson, MSCA Coordinator, Technical Support

DATE: June 19, 1991

SUBJECT: MSCA Site Inspection (SI) Report
ATF Davidson Co, Inc.
Main Street
Northbridge (Whitinsville)
Massachusetts

MAD046128559 MA Site # 2-0112

Attached, please find the MSCA Site Inspection (SI) report for ATF Davidson Co, Inc. to be submitted to the EPA for completion of the MSCA grant task. This report includes a cover memo and documentation.

RECOMMENDATIONS

The ATF Davidson Co. site has been divided into two locations, Covitch and Arcade, for ease of understanding within the Site Investigation report. Covitch had high levels of oil and grease and low levels of VOCs. Remediation has succeeded in removing the majority of the contamination. Analysis of samples from monitoring wells at the Arcade indicate that contamination is concentrated in one area on-site. Currently, ATF Davidson is listed as a Phase 4. Recommendation under the criteria of the MCP is to request updated data. Recommendation is to prepare a PA-HRS under CERCLIS.

covitchs.i

75 Grove Street • Worcester, Massachusetts 01605 • FAX (508) 792-7621 • Telephone (508) 792-7653

TO: Lynne Chappell, Section Chief, Technical Support, CRO

THRU: Michael Bingham, Branch Chief, Technical Support, CRO

FROM: Don Hanson, MSCA Coordinator, Technical Support, CRO

DATE: June 19, 1991

SUBJECT: MSCA Site Inspection (SI) Report
ATF Davidson Co, Inc.
Main Street
Northbridge (Whitinsville)
MA. 01588

MAD046128559 MA Site # 2-0112

This Site Inspection (SI) presents the finding of research and a review of the files located at the Department of Environmental Protection (DEP), Central Regional Office (CRO) in Worcester, MA. This report is designed to meet the requirements of the United States Environmental Protection Agency (USEPA) site Inspection report for completion of the MSCA grant task. This report includes a transmittal memo.

Background information used to generate this document was obtained through review of the DEP/CRO files and interviews.

SITE DESCRIPTION AND HISTORY

The ATF Davidson site is a 64 acre facility directly west of the downtown portion of Whitinsville, a village within the Town of Northbridge, MA (Fig. 1). Northbridge has a typical New England climate with an average net precipitation of approximately 46 inches. The site is located in the 50 - 100 year flood plain (DEP/BWSC 1988). The land surrounding the site is zoned as industrial, residential and commercial. There are approximately 2150 people living within a one-mile radius of the site. The mill is in the most densely populated portion of the village. The nearest off-site building is less than 0.1 miles away (Caswell, Eichler & Hill, 1987).

The ATF Davidson Co., (MAD046128559) site, for the purpose of this MSCA SI, has been divided into the Covitch (32 acres) (Figs. 2 & 4) and Arcade (32 acres) locations (Figs. 3 & 4). ATF Davidson, occupied both sites from 1982 to October 1984 (DEP/BWSC 1991). This report will refer to either location when needed and the site as a whole when needed.

The Whitin Machine Works produced textile machines at the Covitch location from approximately 1837 to 1979. From 1941 - 1945, 85% of the facility was converted to war production. After the war, production of textile machines resumed. In 1979, the company converted to the production of graphic arts equipment. Whitin Machine ceased operations in 1982. Major foundry processes at the Covitch location included metal casting, finishing, and heat-treating. Waste on the Covitch property consisted of virgin oil, VOCs, and heavy metals which have been found principally in the "raceway". Lubricating oil that leached from scrap metal dumpsters over the years contaminated soil and groundwater in the raceway section. On-site remediation consisted of an on-site oil/water separator and an air stripping tower. Further discussion of the contamination and subsequent remediation is contained on Page 7 (Sampling Results - Covitch Property) of this report. In 1984, Sidney Covitch, Trustee of Whitinsville Redevelopment Corporation, purchased the former Whitin Machine Works facility. These facilities are now referred to as the Covitch property (Figs. 2 & 4) (DEP/BWSC 1988).

Foundry wastes from the foundry at Whitin Machine Works were mixed with spent foundry sand and deposited from roughly 1930 to 1979 adjacent to the present-day Covitch property in an unlined landfill called the "Arcade". The landfill is on an overburden of river sediments over bedrock. The Arcade facility was built upon this landfill (Figs. 3 & 4). The Arcade property consists of foundry waste which extends roughly 3200 feet along the northern bank of the Mumford River. Total volume of the landfill is estimated at 40,000 cubic yards; total surface area is estimated at 730,000 square feet. Landfill constitutents included 90% spent foundry sand, 5% coal ash, and 5% paint, plating sludge, plating rinsewaters, bromide salt baths, solvents and cutting oils. Foundry sand ranges in size from fine to coarse with some pumice-like material, foundry bed glass and ash. The "Arcade" location, still owned by ATF Davidson, is contaminated with VOCs and heavy metals. VOC contamination appears to be concentrated in one area on the Arcade property. Further discussion of the contamination is contained on Page 8 of this report. Velocity of groundwater movement through the area was calculated to be 52 feet/year. The Arcade facility produces printing machines. Processes include turning, milling, grinding, metal treatment, assembly, painting and testing (DEP/BWSC 1988).

The Arcade property is bordered by the Mumford River to the south, residential housing to the east, by the Main Street to the north, and by the Whitinsville Water Company to the west. The Arcade consists of a one-story building, undeveloped land and the landfill (Figs. 3 & 4) (DEP/BWSC 1988).

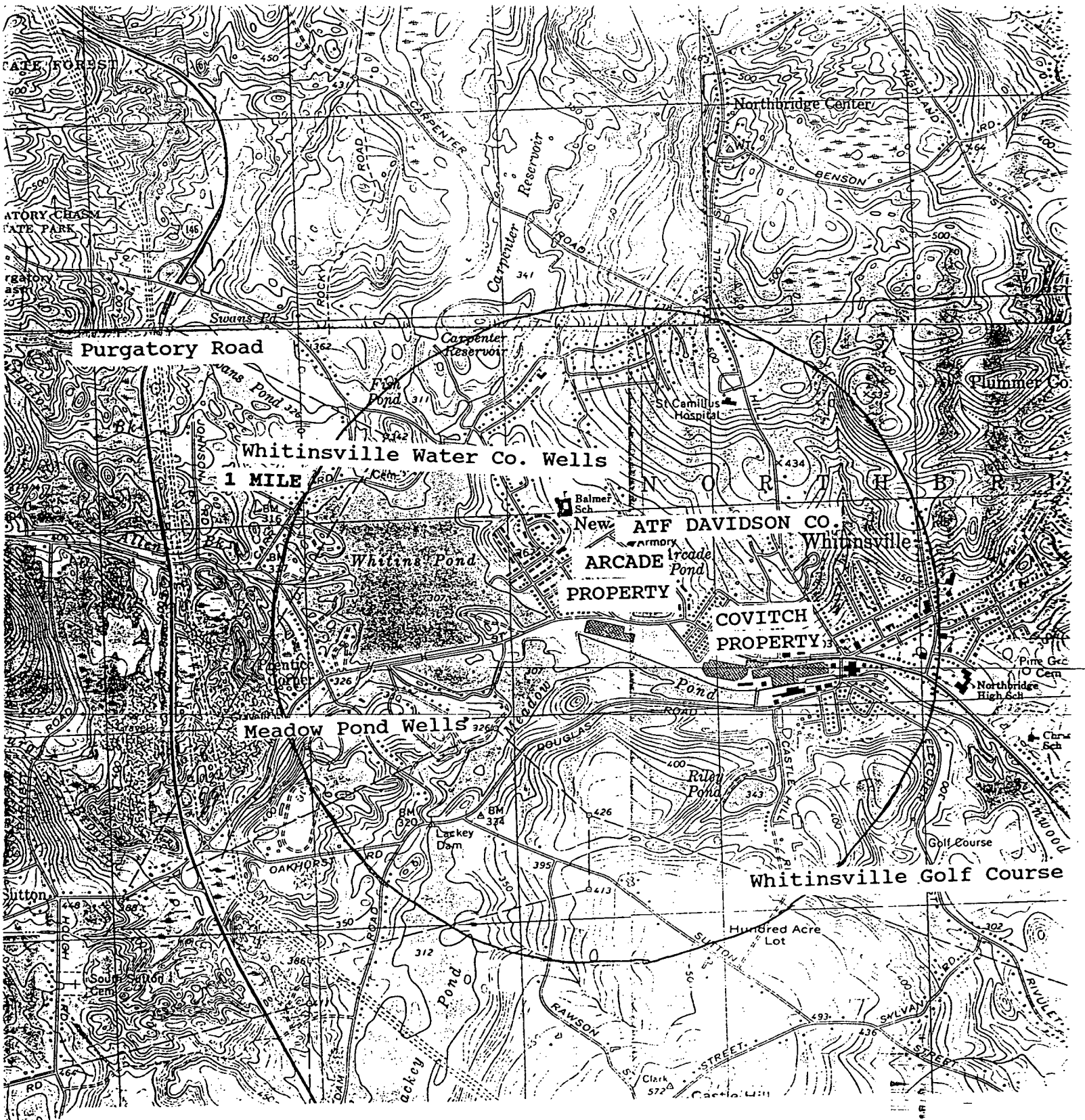


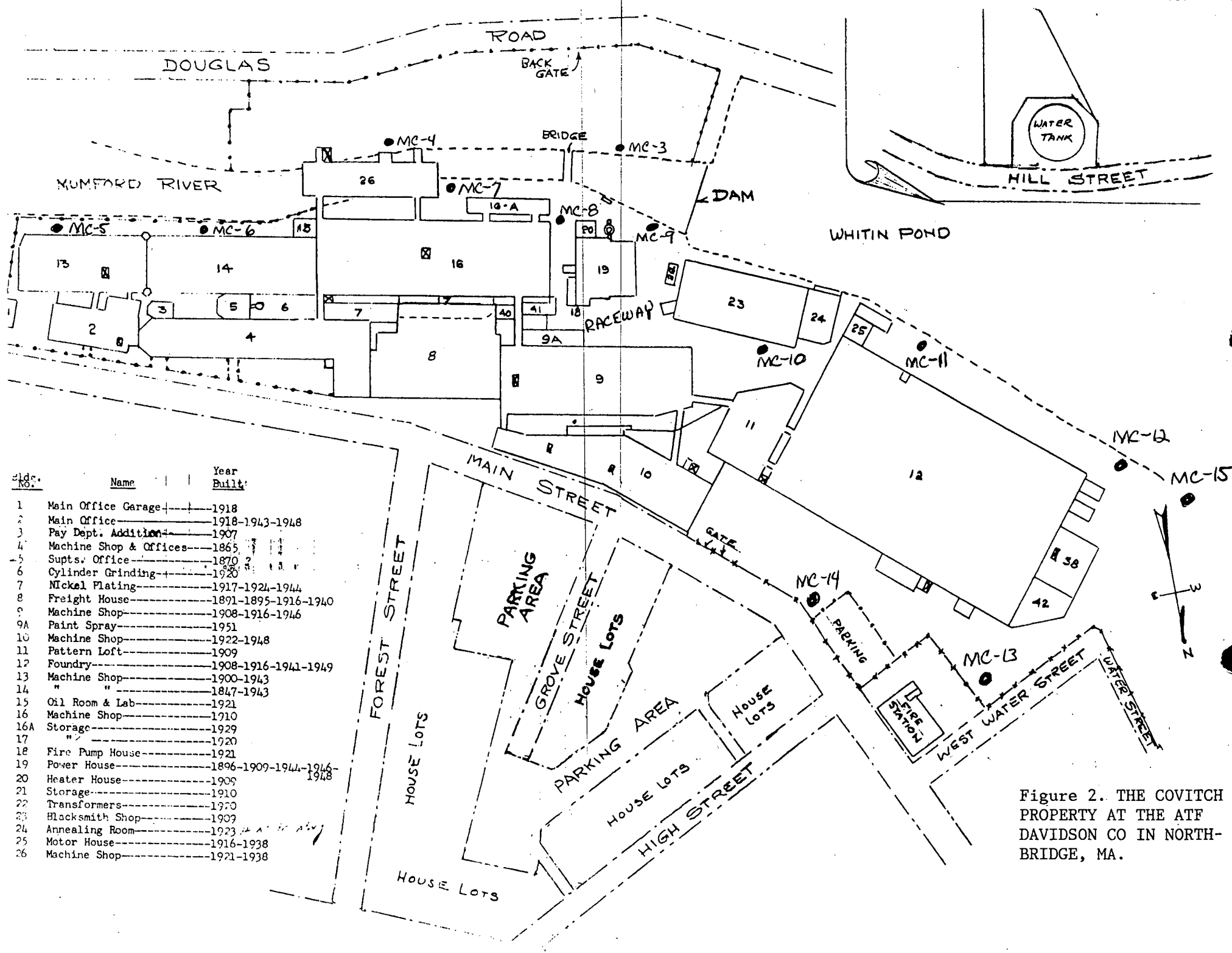
Figure 1. Locus Map of the ATF Davidson Co., Inc. Facility in Northbridge, MA.

SCALE 1:24 000

1 0 1 MILE

1000 0 1000 2000 3000 4000 5000 6000 7000 FEET

1 5 0 1 KILOMETER



Bldg. No.	Name	Year Built
1	Main Office Garage	1918
2	Main Office	1918-1943-1948
3	Pay Dept. Addition	1907
4	Machine Shop & Offices	1865
5	Supts. Office	1870 ?
6	Cylinder Grinding	1920
7	NIckel Plating	1917-1924-1944
8	Freight House	1891-1895-1916-1940
9	Machine Shop	1908-1916-1946
9A	Paint Spray	1951
10	Machine Shop	1922-1948
11	Pattern Loft	1909
12	Foundry	1908-1916-1941-1949
13	Machine Shop	1900-1943
14	" "	1847-1943
15	Oil Room & Lab	1921
16	Machine Shop	1910
16A	Storage	1929
17	"	1920
18	Fire Pump House	1921
19	Power House	1896-1909-1944-1946-1948
20	Heater House	1909
21	Storage	1910
22	Transformers	1920
23	Blacksmith Shop	1909
24	Annealing Room	1923
25	Motor House	1916-1938
26	Machine Shop	1921-1938

Figure 2. THE COVITCH PROPERTY AT THE ATF DAVIDSON CO IN NORTH-BRIDGE, MA.

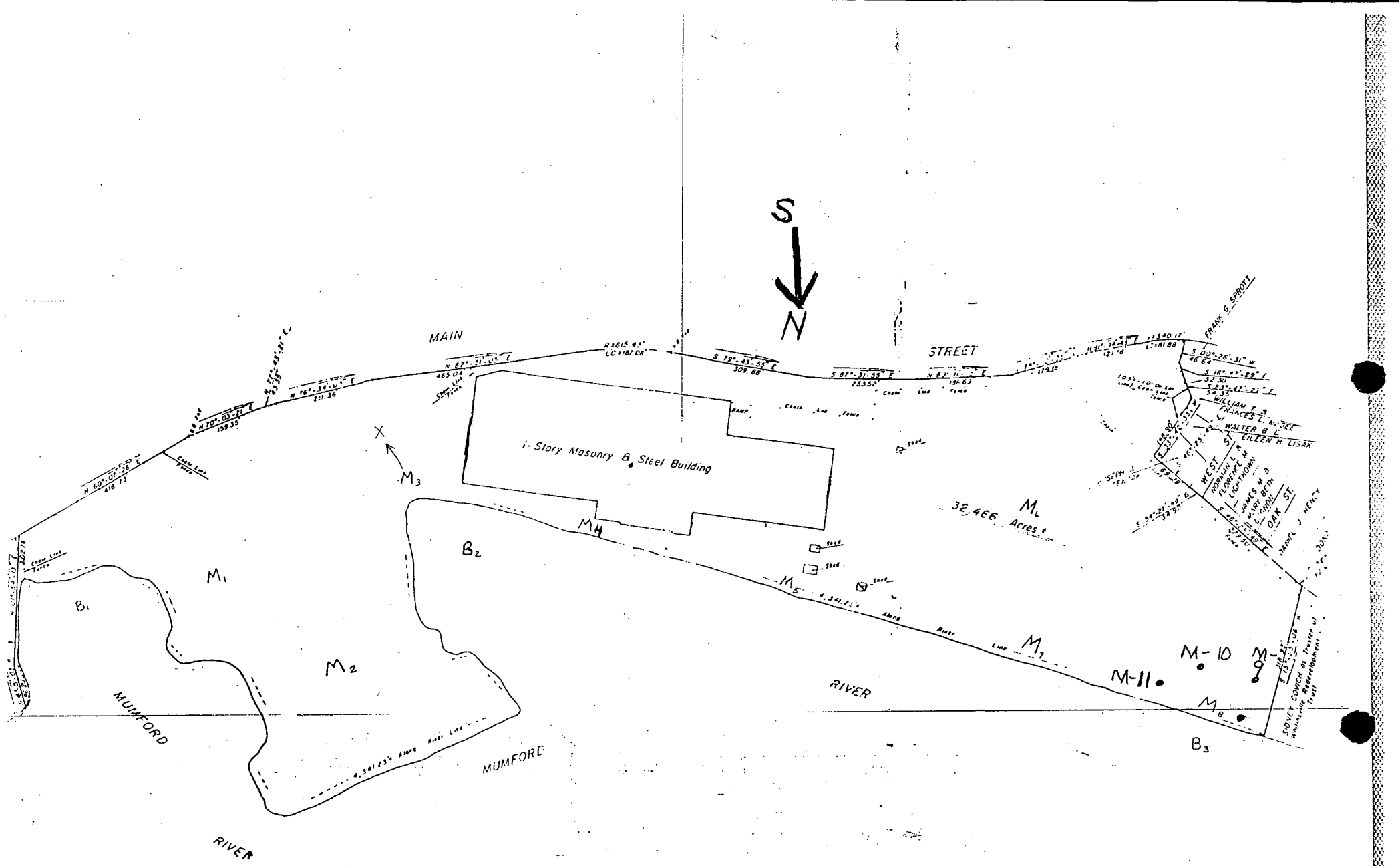


FIG. 3. THE ARCADE FACILITY AT THE ATF DAVIDSON CO IN NORTHBRIDGE, MA.

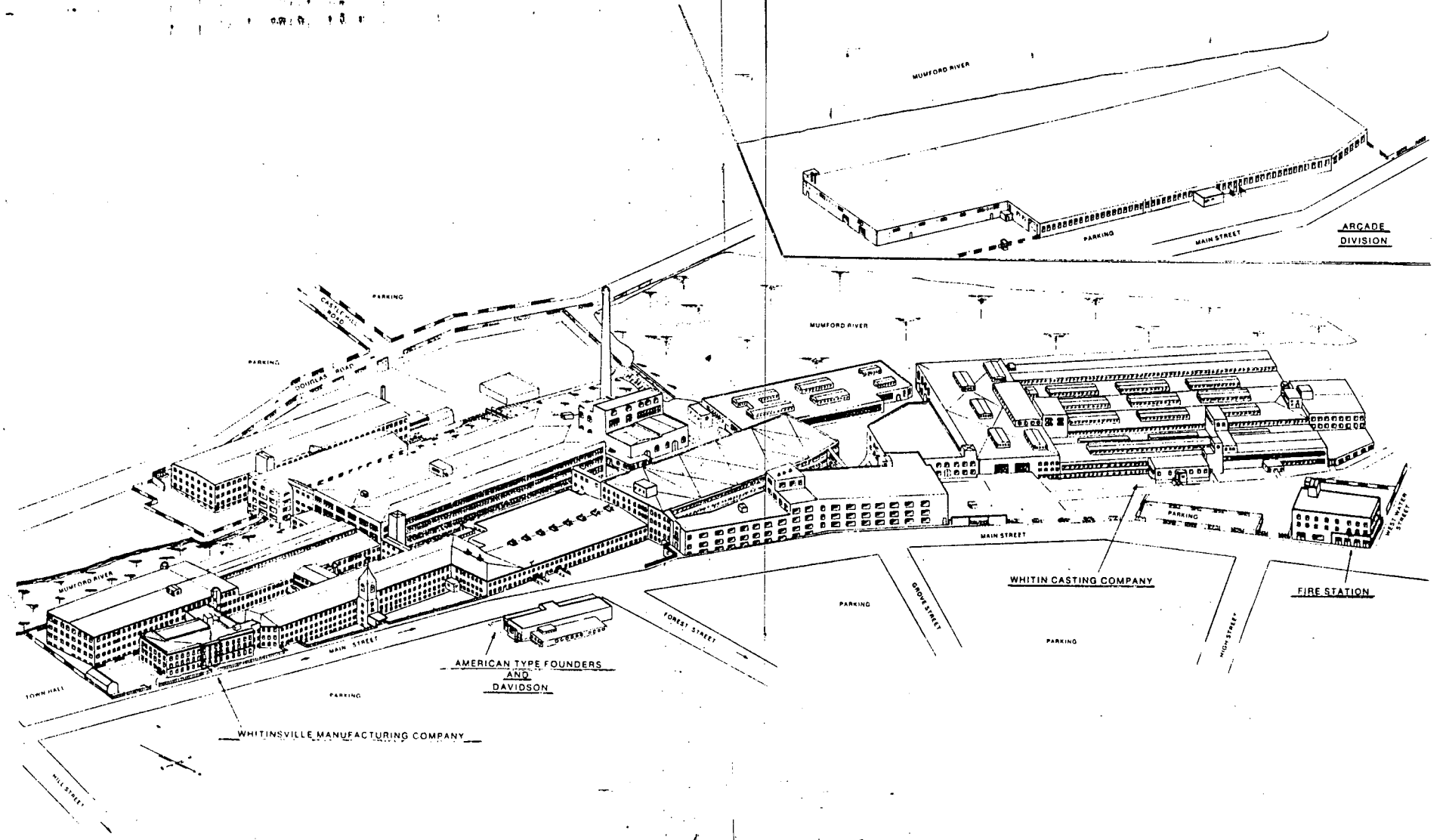


FIG. 4. THE ATF DAVIDSON CO, SHOWING THE COVITCH LOCATION AND THE ARCADE LOCATION IN NORTHBRIDGE, MA.

1975

In contrast to the Arcade property, the Covitch property consists of overburden containing borrowed fill. The fill was brown (sometimes gray below the water table) silty fine to medium sand with occasional coarse gravel, cobbles and small boulders. This characterization also closely resembles the native till in the area, and thusly, the borrow was believed to have been locally obtained. The Covitch property is almost completely developed with a variety of large manufacturing facilities dating back to the last century. The property is bounded to the east by the Town Hall, west by the Arcade property, north by Main Street, and south by Douglas Road and the Mumford River (Caswell, Eichler & Hill, 1985).

The Covitch property is on both the north and south sides of the Mumford River. A large dam exists about 1000 feet inside the western property boundary, and a smaller dam is at the eastern property boundary. The overall parcel is approximately 2500 feet long on both sides of the Mumford river. Seepage volocity was calculated to be 3.5 feet/year in the Covitch area. In addition, a former coal-ash disposal area is along the south bank of the river on Douglas Road. Groundwater flows northward in this area to the river at approximately 1.0 feet/year (Caswell, Eicher & Hill, 1985).

Untreated electroplated wastewater was discharged from the Covitch property to the Mumford River from 1930 to 1965 (DEP 1988). The practice was discontinued in 1965 when a wastewater treatement plant was installed. Treated wastewater was discharged to the Mumford River (NPDES permit MA0001252, issued 9/20/74) from 1965 until September 1982 when the treatment plant ceased operations (DEP/BWSC, 1982).

The Natural Heritage & Endangered Species Program (1991) reported that no Mass. listed "rare wetland species of wildlife" inhabit an area within 4 miles of the ATF Davidson Co. The Blackstone River, however, contains the habitat of a rare species of wetland wildife approximately 5.0 to 5.5 miles downstream of the site.

The ATF/Davidson site is within the Blackstone River watershed basin. Surface runoff flows directly south into the Mumford River which in turn flows southeasterly approximately four miles to its junction with the Blackstone River. The Mumford River is classified by the Commonwealth of Massachusetts as a Class B river, which means its suitable for bathing and

recreation use (DEP/BWSC 1988). Between the site and 1 mile, the Mumford River flows through the Village of Whitinsville. Between 1 & 2 miles, the river was dammed to form Linwood Pond. Between 2 miles and 3 miles, the river flows through the Villages of Linwood and North Uxbridge. Between 3 miles and 4 miles, the river goes through a large wetland and again is dammed to form Caprous Pond. At the 4 mile mark, the river passes through the Town of Uxbridge. At 4.5 miles, the Mumford joins with the Blackstone River. At 5 miles and extending for about 1/2 mile downstream, there is a large wetland that is inhabited by a MA Rare species of wildlife. Between 5 miles and 9 miles, the Blackstone goes through a relatively unpopulated area. At 9 miles, the river passes through the Village of Millville. Between 9 miles and 11.5 miles, the River passes through a relatively low populated area. Between 11.5 miles and 15 miles, the river passes through the Town of Blackstone, MA and Woonsocket, RI (USGS, Blackstone; Grafton; Milford; Uxbridge. 1979).

Twelve years of flow records for the Mumford River (1939 - 1951) measured by the USGS at the East Douglas Station determined the mean annual discharge to be 44.8 c/f/s. The East Douglas Station data should be considered conservative due to influx between the Station and the ATF Davidson Co.(Caswell, Eichler & Hill 1987). There are two known surface water uptakes along either the Mumford River or the Blackstone River in Massachusetts after its conversion with the Mumford. These locations are discussed later in this report.

RCRA information reviewed by EPA/RCRA indicated a status of "convertor" for the ATF Davidson Co., Inc. facility. A "convertor" is a former TSDF facility which changed status to that of a generator-only after November 19, 1980. Although this facility is subject to RCRA Corrective Action authorities, EPA/RCRA concluded that the completion of a Site Inspection for this site is appropriate at this time (Smith, N. 1991).

There are four hazardous waste sites within one mile of the site on the DEP/CRO data-base (DEP/BWSC 1991). They are Alternatives Unlimited, Inc. (MA 2-0694), Eagle Printing Company (MA 2-0502), Nutting's Body & Frame Co. (MA 2-0300), and Polyplate, Inc. (MA 2-0301). Alternatives Unlimited Inc. is on 54 Douglas Road in Northbridge, MA (Fig. 2). This property was formerly owned by the Whitin Machine Works. The site is currently undergoing remediation of fuel oil from a LUST condition. There is no evidence to suggest that Alternatives Unlimited is atop the coal ash deposit area as was described earlier (Lycott 1986). There are no CERCLIS sites within one mile of this site (USEPA 1991).

Tables 1 and 2 list those towns which are within four miles of the site. Please note that the population is based on the recent national census and 1989 MA elections (Census Bureau 1991) and therefore, may not correlate exactly to population counts of public water usage. For towns that are partially within four miles, no distinction has been made between residents living inside the four mile radius and those living outside (DEP/DWS. 1991).

TABLE 1. PUBLIC GROUNDWATER SUPPLIES WITHIN FOUR MILES OF ATF DAVIDSON CO., INC., NORTHBRIDGE, MA.

Town	Groundwater Supply Location	Number of People Served	Total
Douglas	GPW West Street TWF West Street	2450	2450
Northbridge	GPW Meadow Pond RW Meadow Pond (Fig. 1) RW Meadow Pond (Fig. 1) TWF Meadow Pond (Fig. 1) TWF Mendon Road	15336	15336
	Whitinsville Water Co. (Fig. 1)	4536	19872
Sutton	GPW Hatchery Road Well	700	700
	GPW #1 Putnam Hill Road GPW #2 Putnam Hill Road GPW #3 Putnam Hill Road	748	1448
Uxbridge	GPW #1 Blackstone Street GPW #2 Blackstone Street GPW #3 Blackstone Street	7600	7600

The Hatchery Road Well (Sutton) and the Blackstone Street Wells (Uxbridge) are farther than 4 miles from the site. The West Street Wells (Douglas) are 3.5 miles southwest of the site. The GPW Meadow Pond Well (Northbridge) was closed in 1950s because it was used for air conditioning purposes for the Whitin Machine Works (BOH 1991). The Mendon Road Well is located in Sutton. The Putnam Hill Road Wells (Sutton) are 3.8 miles East of the site. The Whitinsville Water Company controls all public water for the Town of Northbridge. The Whitinsville Water Company

is privately owned (DEP/DWS 1991).

TABLE 2. POPULATION DISTRIBUTION OF THE USAGE OF WATER SUPPLIES IN TOWNS WITHIN FOUR MILES OF THE ATF DAVIDSON CO, INC. IN NORTHBRIDGE, MA

Town	Population 1989 Count*	Population Public Water	Population Private Water
Douglas	5045	2450	2595
Northbridge	13300	19872	UNK
Sutton	6876	1448	5428
Uxbridge	10251	7600	2651

*Based on either 1989 census or 1990 state elections.

In Northbridge, there are no groundwater private water wells within 1 mile of the site. The nearest location are the private homes in Purgatory Road (1.0 - 2.0 miles NW) (Fig. 1) (BOH 1991) The Whitinsville Country Club on Fletcher Road (1.1 miles SE) (Fig. 1) uses public water for drinking purposes. The club, however, uses surface water from the Mumford River for irrigation. During the summer period of roughly 180 days, water use averages 70,000 gallons/day. During the height of the summer, the club will use about 100,000 gallons/day (Zepp, 1991).

In Uxbridge, Smith (1991) reported no private wells along either the Mumford River or the Blackstone River. There are, however, three wells next to the Blackstone River formerly owned by Burnat Yarns. The Burnat Wells are gravel packed wells constructed in 1946 approximately 4.1 miles from the site. These wells have only recently been purchased by the Town of Uxbridge and are currently being "put on line". Analysis of groundwater samples has shown that contaminates include #6 fuel oil, TCE, DCE, MEK (DEP/BWSC 1989) at levels below the MCL values. The Sherman-Baker Farm in Uxbridge uses surface water for irrigation during the driest time of the year (46,000 gallons/day for 10 - 12 days)(Smith, 1991).

SAMPLING RESULTS - COVITCH PROPERTY

In 1985, 15 overburden monitoring wells (MC-1 - MC-15) were attempted on the Covitch Property. Four wells (MC-4, MC-5, MC-8 and MC-9) met refusal (Fig. 2). In addition, five additional monitoring wells (AP101 - AP105) were attempted in the building 9/raceway property. AP-101, AP-102, AP-103 encountered refusal at a shallow depth. AP-104 and AP-105, however, were advanced (Fig. 5) (Caswell, Eichler & Hill, 1985b).

Soil samples taken in 1985 from AP-104 (S-1, S-6) and AP-105 (S-1, S-5) was analyzed for barium, oil and grease, total phenols and priority pollutant metals. Only arsenic was noted at elevated concentrations in AP-104; S-4 (98 ppb), S-5 (71 ppb), and S-6 (66 ppb). Its origin, whether being naturally occuring or having been a componet of the borrow fill, is unknown. The acute toxicity level for arsenic in the soil is 100 ug/g. The submitted report did not indicate the source of this information. In addition, AP-104 (S-4), AP-105 (S-1, S-3) were analyzed for VOCs per EPA 5030. Laboratory results, however, indicated no volatile organic compounds. Phenols were detected at less than 0.3 ug/g. Oil and grease were found in samples AP104 S-1 (10,000 ppb), AP104 S-2 (12,000 ppb), AP104 S-3 (180 ppb), AP104 S-4 (470 ppb), AP104 S-5 (80 ppb), AP104 S-6 (1,000 ppb), AP105 S-1 (80 ppb), AP105 S-2 (1,800 ppb), AP105 S-3 (15 ppb), AP105 S-4 (15 ppb), AP105 S-5 (1,200 ppb) (Caswell, Eichler & Hill, 1985b).

Each groundwater sample was analysed in 1985 for volatile organic compounds (EPA 624), barium, priority pollutant metals, and total cyanide. Samples from MC-7 and MC-14 were also analysed for oil and grease, and total phenols. No VOCs were detected in the groundwater samples, total cyanide was detected at less than 0.01 mg/l, and metals were found at levels below MA Drinking water Standards and Guidelines. Phenols were found at 12 and 16 ppb in MC-7 and MC-14, respectively. Oil and grease was found at 2,000 ppb and 24,000 ppb, respectively (Caswell, Eichler & Hill, 1985b).

Between January 1986 and July 1986, a 150 foot long interceptor/recovery trench plus a 65 foot high air stripping tower with a recovery well were installed adjacent to building 9 for the recovery and removal of VOCs from the groundwater. The air stripping tower was constructed in conjunction with the dewatering pump in the groundwater. The recovered oil was directed to the aeration tower for treatment of dissolved volatile contaminants. In June, three observation wells (OW 1 - OW 3) were installed in the trench area (Fig. 5) (Nepcco, Inc. 1987) .

In February 1987, groundwater samples from the observation wells OW 1 - OW 3 were analyzed for VOCs using EPA method 601, 602 (Table 3). In June 1986, the air stripper was put into service. Data collected and analyzed from the air stripper influent between June 1986 and Feb. 1987, indicated a significant drop in VOC levels (Table 4) (Nepcco 1987).

TABLE 3. GROUNDWATER QUALITY AT MONITORING WELLS WHITE CONSOLIDATED INDUSTRIES WHITINSVILLE, MA. (Nepcco 1987)

Sample Date: February 17, 1987

EPA Test Method 601, 602

Contaminant	Well		
	Well 1	Well 2	Well 3
1,1 - Dichloroethene	ND*	ND	ND
1,1 - Dichloroethane	17**	5	4
1,1,1 - Trichloroethane	12	2	3
Trichloroethene	3	1	1
Tetrachloroethene	3	1	12
Trichlorofluoromethane	ND	ND	ND
Benzene	12	ND	ND
Toluene	57	ND	11
Xylene (total)	40	ND	31

* - ND - Non-detected; method detection limit was 1 ppb.
** - Results given in ppb.

TABLE 4. GROUNDWATER QUALITY SUMMARY OF AIR STRIPPER INFLUENT, COVITCH LOCATION ATF DAVIDSON CO, NORTHBRIDGE, MA (Nepcco 1987)

Sample Date	Total VOCs by EPA Method 601/602 (ug/l)
6/13/86	102
6/24/86	748
7/8/86	117
7/18/86	130
7/23/86	112
8/6/86	187
11/5/86	113
12/16/86	39
1/5/87	54
2/11/87	41

A hydropurge pump was installed to remove contaminated groundwater. In addition, the hydropurge pump would form a cone of depression in the watertable. In turn, dissolved and separate phase petroleum would migrate to the recovery well. Floating petroleum would be removed via a petropurge pump and stored in a on-site recovery tank. The hydropurge pump passed contaminated water through the air stripping tower for removal of the VOCs. No petroleum was removed, however, due to petroleum levels (0.0 - 0.2") which did not allow activation of the pump. Most of the oil detected during earlier monitoring well tests (AP 104 & AP 105) may have been removed as a result of earth removal for construction of the interceptor trench (Nepcco, 1987b).

In conclusion, treatment of the dissolved phase contamination at the Covitch property has resulted in VOC levels to drop from 750 ppb to less than 50 ppb in the spring of 1987. Given the low levels of VOC and amount of water in the water table and the groundwater flow to the Mumford River, the consultant recommended to stop further treatment of the groundwater (Nepcco, 1987b).

SAMPLING RESULTS - ARCADE PROPERTY

On the Arcade property, eight shallow monitoring wells (M-1 through M-8) were installed. Groundwater samples collected were analyzed for VOCs (EPA 624), metals and inorganics, barium, and total cyanide. Groundwater samples from M-3 were also analyzed for oil and grease. Soil samples were collected from each monitoring well from the surface and every 5 feet in depth (Caswell, Eichler & Hill, 1985).

Five benthic cores (B-1 through B-5) were taken from the littoral zone of the Mumford River bottom. Samples were analyzed for priority pollutant metals and barium (Caswell, Eichler & Hill, 1985).

Analysis of groundwater samples suggests that volatile organic contamination is significant only in the M-3, M-6, and M-8 area (Table 5). Analysis of samples from MW-1, 2, 4, and 5 did not reveal VOCs (Caswell, Eichler & Hill, 1985).

TABLE 5. LEVELS OF VOLATILE ORGANIC COMPOUNDS FOUND IN THE GROUNDWATER FROM THE ARCADE FACILITY AT THE ATF DAVIDSON COMPANY IN NORTHBRIDGE, MA

July 1985 ug/l

Contaminant	Monitoring Well			
	MW-3	MW-3(dupl)	MW-6	MW-8
Vinyl Chloride	190	210	BDL	260
1,2-t-dichloroethylene	250	250	15	610
Trichloroethylene	10	10	30	30
Tetrachloroethylene	BDL	BDL	950	Trace

BDL = Below detectable limits
Trace = Probable presence below listed detection level

Analysis of groundwater samples for metals and cyanide revealed levels well below the MA Drinking Water Standards for all metals except Barium. Barium, whose drinking water standard is 1000 ppb, was near or above that standard at M-4 (1,000 ppb), M-5 (2,900 ppb), M-6 (910 ppb), M-80 (1,200 ppb) (Caswell, Eichler & Hill, 1985).

The level of oil and grease in M-3 was less than 500 ppb (Caswell, Eichler & Hill, 1985).

The five benthic samples (B-1 through B-5) taken from the river bottom in 1985 were characterized as dark organic peat and muck (Figure 3) (Caswell, Eichler & Hill, 1985). None of the 14 metals analyzed for by the EP TOX had levels above the maxium allowable concentrations of contaminants per the MA Hazardous Waste Regulations 310 CMR 30.125 (DEP 1986). For example, the levels of chromium (Table 6) were far below the allowable level of 5000 ppb of chromium per 310 CMR 30.125.

TABLE 6. LEVELS OF CHROMIUM IN RELATION TO THE FLOW OF THE MUMFORD RIVER, FROM UPGRADIENT TO DOWNGRADIENT NEXT TO THE ARCADE FACILITY, ATF DAVIDSON COMPANY, NORTHBRIDGE, MA (Caswell, Eichler & Hill, 1985).

SAMPLE LOCATION	CONTAMINANTE LEVEL
B-5	65 ug/g
B-1	410 ug/g
B-2	250 ug/g
B-3	400 ug/g
B-4	100 ug/g

The origin of the chromium is either the Arcade facilty or up-river from the facility. Arcade officials stated that they never used chromium. Analysis of groundwater samples from M-1 through M-8 did not show chromium. Since the river sediments showed chromium, probably the origin of the chromium is/was from an ungradient source (Caswell, Eichler & Hill, 1985).

The second source would be from textile and tannery operations reportedly formerly situated up-river from the Arcade facility. In theory, the organic chromium in the discharge water is suspended in the flowing river water until nearing the dam at the ATF Davidson Co. The decreased flow-rate of the river would cause the organic chromium to settle out (Caswell, Eichler & Hill, 1985). Independent confirmation of the existance of either type of industry upgradient from the ATF facility has not been done.

In December 1985, additional groundwater samples were obtained from M-1 through M-8 and analyzed per EPA method 624. As with the July 1985 groundwater samples, samples analyzed from wells MW-1, 2, 4, and 5 did not reveal detectable levels of contaminants (Table 7) (Caswell, Eichler & Hill, 1986).

TABLE 7. LEVELS OF VOLATILE ORGANIC COMPOUNDS FOUND IN THE GROUNDWATER FROM THE ARCADE FACILITY AT THE ATF DAVIDSON COMPANY IN NORTHBRIDGE, MA.

December 1985 ug/l

Contaminant	Monitoring Well			
	M-3	M-6	M-7	M-8
Vinyl Chloride	80	180	BDL	380
1,2,-t-Dichloroethylene	20	330	BDL	1100
Trichloroethylene	BDL	13	BDL	trace
Tetrachloroethylene	BDL	27	BDL	BDL
1,1-Dichloroethylene	BDL	BDL	9	BDL

BDL = Below detectable limits
Trace = Probable presence below listed detection level

Also, groundwater samples from M-1 through M-8 were again sampled and analyzed for arsenic, barium, and zinc. Levels of arsenic were below MA Drinking Water Standards. There is not a MA Drinking Water Standard or Guideline for zinc. Levels of barium were near or above the 1000 ug/l MA Drinking Water Standard in M-4 (720 ppb), M-5 (3,100 ppb), M-6 (730 ppb) and M-8 (1,400 ppb) (Caswell, Eichler & Hill, 1986).

From February 1986 through August 1986, three additional rounds of EPA 624 analysis were done on M-1 through M-8 (Table 8a, Table 8b, Table 8c). Groundwater samples analyzed from M-1, M-2, M-5 did not contain VOCs per EPA Method 624 (Caswell, Eichler & Hill, 1986).

TABLE 8a. CONTAMINANT LEVELS IN MONITORING WELLS AT THE ARCADE FACILITY, ATF DAVIDSON COMPANY NORTHBRIDGE, MA. (Caswell, Eichler & Hill, 1986).

ug/l (February 10, 1986)

Contaminant	Monitoring Well				
	M-3	M-4	M-6	M-7	M-8
Vinyl Chloride	19	BDL	Trace	BDL	Trace
1,2-t-Dichloroethylene	9	BDL	Trace	BDL	380
Trichloroethylene	BDL	BDL	Trace	BDL	Trace
Tetrachloroethylene	BDL	BDL	73	BDL	Trace
1,1,1,Trichloroethane	BDL	BDL	Trace	BDL	Trace
Toluene	BDL	BDL	BDL	6	BDL
Chloroethane	BDL	25	BDL	BDL	BDL

TABLE 8b. CONTAMINANT LEVELS IN MONITORING WELLS AT THE ARCADE FACILITY, ATF DAVIDSON COMPANY NORTHBRIDGE, MA. (Caswell, Eichler & Hill, 1986).

ug/l May 13, 1986

	M-3	M-4	M-6	M-7	M-8
Vinyl Chloride	29	BDL	76	BDL	600
1,2-t-Dichloroethylene	11	BDL	75	BDL	1600
Trichloroethylene	trace	BDL	BDL	BDL	26
Tetrachloroethylene	BDL	BDL	12	BDL	BDL
1,1,1,Trichloroethane	BDL	BDL	BDL	BDL	BDL
Toluene	BDL	BDL	BDL	BDL	BDL
Chloroethane	BDL	25	BDL	BDL	BDL

TABLE 8c. CONTAMINANT LEVELS IN MONITORING WELLS AT THE ARCADE FACILITY, ATF DAVIDSON COMPANY NORTHBRIDGE, MA. (Caswell, Eichler & Hill, 1986).

ug/l	August 6, 1986				
	M-3	M-4	M-6	M-7	M-8
Vinyl Chloride	12	BDL	80	BDL	220
1,2-t-Dichloroethylene	31	BDL	50	BDL	720
Trichloroethylene	BDL	BDL	BDL	BDL	15
Tetrachloroethylene	BDL	BDL	Trace	BDL	BDL
Toluene	BDL	BDL	BDL	6	BDL
Chloroethane	BDL	12	BDL	BDL	BDL

In January 1987, three additional monitoring wells (M-9, M-10, M-11) were installed in a radial fashion in an area hydraulically up-gradient from M-8. Each well was approximately 100 feet from M-8 and its adjacent counterpart (Figure 3). Analysis of samples (Table 9) indicated that the contaminants (ie., 48 ug/l of Tetrachloroethylene) found in M-8 were observed in low/non-existant levels in the M-9 through M-11 groundwater samples (ie., 1.2 ug/g, Tetrachloroethylene in M-9). Soil samples were also nearly devoid of of the same contaminants found in M-8 (Caswell, Eichler & Hill 1987).

Analysis of these data concludes that the contamination observed at M-8 is characteristic of a localized zone of contaminated groundwater. The consultant concluded that groundwater and the contaminants are obviously flowing toward and being diluted by the Mumford River, thus no emergency health hazard exists (Caswell, Eichler & Hill 1987).

TABLE 9. RESULTS OF ANALYSIS OF GROUNDWATER SAMPLES FROM THREE MONITORING WELLS AT THE ARCADE FACILITY, ATF DAVIDSON CO, NORTHBRIDGE, MA. (Caswell, Eichler & Hill, 1986).

EPA Method 8240 ug/g

Contaminant	Monitoring Well		
	B-9	B-10	B-11
Tetrachloroethylene	1.2		
Toluene	3.8	2.7*	4.3
		4.8**	

* = Above Water Table
** = Below Water Table

TABLE 10. CONTAMINANT LEVELS IN MONITORING WELLS AT THE ARCADE FACILITY, ATF DAVIDSON COMPANY NORTHBRIDGE, MA. (Caswell, Eichler & Hill, 1986).

January 1987 ug/l

EPA Method 624

Contaminant	Monitoring Well					
	M-6	M-7	M-8	M-9	M-10	M-11
Chloromethane	48	BDL	BDL	BDL	BDL	BDL
Vinyl Chloride	BDL	BDL	280	BDL	BDL	BDL
1,2-t-Dichloroethylene	13	BDL	640	TRACE	BDL	BDL
Trichloroethylene	7.6	BDL	17	TRACE	BDL	BDL
Tetrachloroethylene	13	BDL	BDL	48	BDL	BDL

In 1987, Caswell, Eichler & Hill, Inc. (CEH) prepared a Risk Assessment which focused on the contaminated area surrounding M-8 at the Arcade property. The Risk Assessment was comprised of a Hazard Assessement, Exposure Assessment and a Risk Assessment. Investigation centered about the average levels of three VOCs that had been continually present in the groundwater samples from M-8. CEH investigated possible routes of exposure per air and surface water. Potential receptors included local residents and employees of local businesses.

CEH (1987) concluded that the concentrations of the contaminates are calculated to be very low in both pathways and that the risk associated with exposure were calculated to be negligable. Although CEH used an average level of the three VOCs present in the groundwater instead of the highest levels, it is doubtful whether these figures would have altered the results.

CEH used Resource Analysts, Inc. of Hampton New Hampshire to analyse soil and water samples from this site. No specific information is available regarding sample collection and handling methodologies. Resource Analysts continues to be a Mass. State Centified laboratory (Appendix A). It is unknown if the standards of the mid-1980's are the same as those required for the present. Results of blanks or background samples were not available which leads to the conclusion that neither blanks nor background samples were used. Therefore, results should be suspect.

Neppcco (New England Pollution Control Co., Inc. of Norwalk, CT.) also did not appear to use blanks or background samples as evidenced by the lack of mention of blanks and background samples in their "Chain of Custody" form (Appendix B). Therefore, results should be suspect.

SUMMARY

The ATF Davidson Co. is divided into the Covitch Property and the Arcade Property. Contamination at the Covitch Property primarily consisted of oil with low levels of VOCs. Use of a air-stripper tower and soil removal effectively lowered the contaminant levels. VOC contamination at the Arcade property appears centered around a monitoring well next to the Mumford River. Heavy metal contamination in the sediments of the Mumford River may be from an up-river source(s). Information was not presented as to possible environmental impact of the heavy metal

contamination in the sediments. In addition, no information was presented as to the location, extent or possible hazard of the former coal ash dump. In addition, conclusions based upon the sampling results would probably be suspect due to the lack of proper QA/QC.

RECOMMENDATIONS

Recommedation is to re-sample the wells on-site to determine the present status of the site. In addition, an analysis of the coal ash centering upon the extent and to determine if contaminantes are leaching into the river. Also, the sediments in the river should be resampled to determine if "clean" sediments are overlying the contaminant-laden sediment. A risk assessment of the heavy metal in the sediments relative to the sport fishing past-times that the river supports should be undertaken. Further investigation regarding the heavy metal source should be undertaken.

The CERCLIS recommendation is to prepare a PA-HRS to determine the status of the site relative to the HRS scoring system. Additional sampling should take place before scoring, however, in order to obtain a clear picture of the situtation on-site.

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APPENDIX A

ATTACHMENT H

RAI CERTIFICATION

The Commonwealth of Massachusetts

Department of Public Health

Experiment Station

37-39 Shattuck Street, Lawrence 01843

Pursuant to reciprocity provisions of the Massachusetts Safe Drinking Water Regulations (Section 11, Paragraph e (9), approval has been granted to the following laboratory to perform specific categories of analyses on Massachusetts drinking waters:

Laboratory: Resource Analysts, Inc.

Location: One Lafayette Road
Hampton Falls, New Hampshire 03844

Director: Russell D. Foster

Approved Categories of Analyses

Chemical

Inorganic: Trace Metals

Organic: Pesticides, Herbicides, Volatile Organics

Continuing certification is contingent upon possession of a currently valid certificate of approval from the state in which the laboratory is located, and on-going participation in EPA performance evaluation samples.

John E. Delaney

John E. Delaney, Ph.D.
Director, Division of Laboratories

Date: December 7, 1983

ATTACHMENT I

STATEMENT OF QUALITY ASSURANCE

RESOURCE ANALYSTS, INC.
STATEMENT OF QUALITY ASSURANCE

RAI stands committed to providing chemical measurements of quality consistent with client needs and requirements in a reasonable time while maintaining cost control. This commitment recognizes the need for data to be representative of the environmental conditions under consideration, and for data to be valid and reliable, suitable for making decisions that involve public health and safety, property rights and legal liabilities. To this end, RAI has developed a company-wide Quality Assurance (QA) Plan and maintains an ongoing QA Program. A QA Officer is appointed by and reports to the President of the Company, independent of other operational and budgetary concerns. RAI is committed to employing proper analytical methods, to acquiring equipment appropriate to the methods and maintaining such equipment in good condition, to securing qualified staff and to coordinating all aspects of operation so as to take raw data and produce a useful report. The QA Program seeks to document all of these activities.

Analytical work is conducted by strict adherence to Standard Operation Procedures (SOP) designed for each project. Routinely used SOP documents include:

EPA 600/4-79-020 Methods for the Chemical Analysis and Wastes

EPA SW 846 Test Methods for Evaluating Solid Wastes

Standard Methods for the Examination of Water and Wastewater, 15th Edition

SOP documents may be adapted from other sources or generated inhouse as client needs may require. Procedural references are a part of recordkeeping and reporting.

Analytical quality control measures are taken to maintain reliability in analytical determinations and to control accuracy and precision.

Primary QC measures consist of analyzing check standards, duplicates and spiked samples (at 10% samples analyzed). Results from such samples are used to prepare control charts defining accuracy and precision of methods.

The Commonwealth of Massachusetts
Department Of Environmental Quality Engineering
Lawrence Experiment Station
37 Shattuck Street, Lawrence, Massachusetts 01843

CERTIFICATION STATUS

OF

COMMERCIAL ENVIRONMENTAL LABORATORIES

CERTIFIED BY MASSACHUSETTS D.E.P.

FEBRUARY 1991

The most recent list of
DEP certified Labs.
5/16/91

EXPLANATION OF CATEGORY DESIGNATIONS AND ABBREVIATIONS

PRIMARY

Categories containing parameters for which EPA and/or DEP has established limits in Drinking Waters.

(WS SERIES) Drinking Waters

- TM - Trace Metals (As, Ba, Cd, Pb, Hg, Se, Ag)
- N - Nitrate - Nitrogen
- F - Fluoride
- Pest. - Pesticides
- Carb - Carbamates
- PCB - Arochlors
- H - Herbicides (2,4-D and 2,4,5-T)
- PAH - Polyaromatic hydrocarbons
- A/P - Adipate/Phthalates
- THM - Trihalomethanes (Chloroform, Bromoform, etc.)
- VOC - Volatile Organics (Regulated & Unregulated)
- CS - Corrosivity Series (Ca, Alk, TDS, Index, etc.)
- Sod - Sodium
- Rad - Radioactivity
- CN - Cyanide
- SO4 - Sulfate
- Cl2 - Chlorine
- Turb - Turbidity
- EDB - 1,2-dibromoethane
- DBCP - 1,2-dibromo-3-chloropropane
- TC - Total Coliform

SECONDARY

Other Environmental Matrices

WP SERIES

- TM - Trace Metals (Fe, Mn, Cu, Zn, Ni, etc.)
- Min - Minerals (Ca, Mg, Na, Hardness, pH, Cl^-, SO4, Solids, etc.)
- Nut - Nutrients (Forms of N and P)
- Demand - BOD, COD, TOC
- Pest - Pesticides
- PCB - Polychlorobiphenyls (Arochlors)
- CN - Cyanide
- VH - Volatile Halocarbons
- VA - Volatile Aromatics
- Phen - Phenolics
- O&G - Oil & Grease
- TSS - Total Suspended Solids
- FC - Fecal Coliform
- HPC - Heterotrophic Plate Count

EXPLANATION OF CERTIFICATION SYMBOLS

FULL

"Full Certification" indicates categories in which laboratory achieved an acceptable level of performance on Evaluation Series (i.e. WS025 and/or WP023), etc. and met all other Department requirements and guidelines.

PROV

"Provisional Certification" indicates categories in which laboratory employed qualified personnel ad approved methodology, but temporarily failed to meet the Department's requirements or guidelines for acceptable performance on Evaluation Series or other proficiency test samples.

STATUS OF COMMERCIAL ENVIRONMENTAL LABORATORIES CERTIFIED BY MASS D.E.Q.E.

OUT OF STATE LABORATORIES

LABORATORY NAME AND LOCATION	I.D. NO., DIRECTOR TELEPHONE NO.	PRIMARY CATEGORIES (WS SERIES) DRINKING WATERS	SECONDARY CATEGORIES (WP SERIES)
Aquarian Analytical, Inc. P.O. Box 186 Morrill Road Canterbury, NH 03224	NH035 Mr. William M. Rice 603-783-9097	FULL: VOC (Regulated only), THM PROV: None at Present	FULL: VH, VA PROV: None at Present
Eastern Analytical, Inc. 130 Hall St. Concord, NH 03301	NH005 William Brunkhorst 603-228-0525	FULL: TM, N, F, PCB, VOC, THM, CN PROV: CS	FULL: TM, Min, Demand, PCB, VH, VA, CN, O&G, Phen PROV: Nut
Resource Analysts, Inc. 1 Lafayette Road Hampton, NH 03842	NH022 Russell D. Foster, Jr. 603-926-7777	FULL: TM, N, Pest., Carb, H, A/P, THM, VOC, CS PROV: F, CN	FULL: TM, Nut, Demand, PCB, Pest, VH, CN, Phen PROV: Min, VA, O&G
WaterTest Corporation of America 33 South Commercial St. Manchester, NH 03108	NH013 Dr. Jennifer A. Fee 603-623-7400	FULL: TM, N, F, THM, EDB & DBCP, CS, Sod, SO4, TC PROV: Pest	FULL: FC PROV: TM, Min, Pest, VH, VA, Phen
Amro Environmental Lab 32 Daniel Webster Hwy. Suite 6 Merrimack, NH 03054	NH012 Nancy Stewart 603-882-7340	FULL: N, F, THM, VOC, Sod, CS, SO4 PROV: TM	FULL: TM, Demand, VH, VA, CN, O&G PROV: Min, Nut, Phen
J.W.C. Enterprises, Inc. d/b/a Chemserve Elm Street Milford, NH 03055	NH023 Jay W. Chrystal 603-673-5440	FULL: N, F, THM, CS, Sod, CN PROV: TM	FULL: TM, Min, Demand, CN, Phen PROV: Pest, VH, O&G
GTEL Environmental Labs Meadowbrook Industrial Pk Milford, NH 03035	NH011 Susan C. Uhler 603-672-4835	FULL: TM, N, F, Pest., H, PCB, PAH, THM, EDB & DBCP, CS, Sod, CN PROV: VOC	FULL: TM, Min, Nut, Demand, PCB, Pest, VH, VA, CN, Phen PROV: O&G

APPENDIX B

87C-0148, 12, 13, 14

New England Pollution Control Co., Inc.
7 Edgewater Place, Norwalk, CT 06855 203/853-1990

CHAIN OF CUSTODY

Client: White Const'd

Site Address: Whitinsville MA

Project Number: 10090

Sample Date: 2-17-87 Hour:

Composite Sample: ____ YES ✓ NO

Preservatives: None

Sample Number(s) 10090-ow1, 10090-ow2, 10090-ow3

Sample Description Water samples from 3 site wells

Collected By: Ray Marma Date: 2-17-87

Released To: TOXIKON Date: 2-13-87

Name of Lab: TOXIKON

Analysis Required: EPA, method 601 & 602
Rush Results & report to Wayne Cobleigh
verbally @ (203) 853-1990